

REMARKS:

In the above amendment, pending claim 1 has been replaced with new claim 1, which Applicants believe obviates the Examiner's 112 objections to the old claim 1.

Claim 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kirkpatrick in view of WO 98/19333, Hansen et al and Miller. After careful review of these cited references, Applicants respectfully submit that the present invention is distinguishable from these cited references and thus patentable over them.

The present invention as amended above has a closed chamber in which a guide path is provided and a mobile element moves along the guide path inside the chamber and transports wafers from one wafer processing apparatus to another. The chamber and the inside of each of the wafer processing apparatuses provide respective environments isolated from each other but in communication with each other through a passage. The mobile element has an arm for handling wafers. The arm loads wafers into and unloads the same from the inside of a wafer processing apparatus through a corresponding passage. As Applicants argued in the amendment submitted on November 5, 2001, wafers are transported from one processing apparatus to another as being subjected to a different process at each apparatus. A great care is paid to prevent any contamination of wafers during processing. Thus, each wafer processing apparatus has a self-contained environment in its inside that provides a controlled atmosphere in which wafers are processed. The same care must also be paid when the wafers are being transported between processing apparatuses. In the present invention, transport of wafers is conducted also in a controlled atmosphere created by the closed chamber.

The Examiner cites Kirkpatrick as the main reference to reject the claims under 35 U.S.C. 103(a). Comparing the limitations recited in the amended claim 1 against the disclosure in Kirkpatrick identifies an important difference between them that in the present invention, an arm for loading and unloading wafers is provided on a mobile element, whereas in Kirkpatrick, a wafer handler 19 is provided at each module 11. The wafer handler is stationary and not movable between the modules. This difference is significant because Kirkpatrick is meant to have a wafer handler 19 stationary at each module 11. Kirkpatrick makes this point very clear by stating that "The present invention overcomes the problems described above by providing a

semiconductor device processing module having a layout that eliminates the need for multi-axis rotational wafer handlers, that provides random access to each of the various processing chambers, that handles wafers in a vacuum environment, and that facilitates maintenance of wafer carrier and wafer carrier slot integrity.” (col. 2, lines 52-68) Thus, Kirkpatrick solves all the problems of conventional devices by providing a wafer handler stationary to each module. In Kirkpatrick, since the handler is provided at each module, the handler does not have to have sophisticated multi-axis capabilities and in fact only has one-axis capability for transporting a wafer between the conveyor 13 and the process chamber 17. Also, in Kirkpatrick, since the handler is provided at each module, not on the wafer carrier, the maintenance of the carrier is facilitated. It is very clear that Kirkpatrick teaches away from having a wafer handler on a movable element. Furthermore, because of this teaching-away, which is the fundamental to Kirkpatrick’s invention, it is believed that Kirkpatrick should be precluded from being combined with any of prior art references, such as WO 98/19333, Hansen et al and Miller, in which an arm itself is movable to transport wafers from one processing place to another.

WO 98/19333 does not teach or suggest the present invention. First of all, it is important to note that the entire system 1 of WO 98/19333 corresponds to a wafer processing apparatus of the present invention and that the spin processing devices 42 and 43 of WO 98/19333 can in no way be considered corresponding to the wafer processing apparatus of the present invention. The entire system 1 of WO 98/19333 may define a self-contained environment which provides a controlled atmosphere in which wafers are processed, but the devices 42 and 43 do not. The devices 42 and 43 function to spin a wafer while a washing chemical is sprayed over the wafer from a nozzle 65. Second, as discussed above, the present invention requires a closed chamber that provides an isolated environment for the mobile element. WO 98/19333 is silent about the closed chamber in which the mobile element moves.

Neither Miller nor Hansen teaches or suggest the closed chamber that provides for an isolated environment for the mobile element. Thus, WO 98/19333, Miller and Hansen, even if combined, cannot be considered rendering the present invention obvious.

Respectfully submitted,

A handwritten signature in cursive script, reading "Tadashi Horie", written over a horizontal line.

Tadashi Horie

Registration No. 40,437

Attorney for Applicants

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, ILLINOIS 60610
(312) 321-4200

APPENDIX 1

1. [A wafer conveyance system, comprising:
 - a chamber having a plurality of outgoing ducts from its circumference, each connecting to an insertion portion of each one of a plurality of wafer processing apparatuses;
 - a guide path provided in said chamber;
 - a mobile element movable along said guide path, and capable of receiving one or more processed wafers, via said duct, from said insertion portion of one of said wafer processing apparatus, of holding and transporting said one or more wafers, and of transferring said one or more wafers, via said duct, to said insertion portion of another wafer processing apparatus]

A wafer conveyance system for transporting one or more wafers that undergo, while being transported, different processes at a plurality of wafer processing apparatuses, each wafer processing apparatus defining a self-contained environment in its inside which provides a controlled atmosphere in which one or more wares are processed, the wafer conveyance system comprising:

- (a) a hermetically closed chamber that provides an isolated environment that is in communication with the inside of each wafer processing apparatus through a passage;
- (b) at least one guide path provided inside the chamber;
- (c) at least one mobile element being movable inside the chamber along the guide path to transport one or more wafers from one wafer processing apparatus to another; and
- (d) at least one arm provided on each mobile element, each arm being accessible to the inside of each wafer processing apparatus through a corresponding passage to load one or more wafers into a wafer processing apparatus and unload the same therefrom.